

Remarks and Arguments:

In the Drawings

Examiner requires a set of formal drawings to replace the informal drawings presently on file. In response to the Examiner's requirement, Applicant attaches a set of formal drawings. Applicant submits that formal drawings comply with the Examiner's drawing requirement.

In the Specification

Examiner states that the Abstract, as amended previously, introduces new subject matter to the disclosure. Applicant respectfully submits that the statement that the components are "selected to have a higher thermal resistivity below T_A than above T_A " is not new matter. Applicant submits that the terms "above" and "below" were inadvertently transposed. Applicant further submits that this amendment is fully supported by the original disclosure. In particular, Applicant directs Examiner to figure 1(a) and the corresponding written description at paragraphs 43 to 45. Figure 1(a) demonstrates clearly that the thermal resistance of the two component mixture is higher below the T_A than above the T_A . Accordingly, Applicant submits that the amended Abstract does not include new subject matter. As such, Applicant requests that Examiner's objection under 35 U.S.C. 132 be withdrawn.

Examiner also objects to the Abstract as including run-on sentences. Applicant has amended the Abstract (attached to this response) to correct any potential run-on sentence problems. Accordingly, Applicant request that Examiner withdraw her objection.

Examiner further states that the formula as newly specified in paragraph 46 is new subject matter. Applicant respectfully submits that the corrected formula is not new subject matter. The amendment merely corrects an inaccuracy in a formula that is well known to those skilled in the art; *i.e.*, the numerator and the denominator of this formula were inverted. Applicant does not claim the formula set out in paragraph 46. The formula is used to illustrate a theoretical thermal resistance R_1 for the one stage heat sink, which was described earlier in the paragraph, that has a heat flux (or Q) value of 100 w.cm^{-2} . Accordingly, Applicant submits that the amended paragraph 46 does not include new subject matter. As such, Applicant requests that the Examiner withdraw her objection under 35 U.S.C. 132.

In the Claims

Examiner rejects claims 1 to 12 under 35 USC 112, second paragraph. In particular, Examiner states that claim 1 is a run-on sentence. Applicant has amended claim 1 to correct any potential run-on sentence problems. Amended claim 1 now recites "... a reactor chamber for housing said reactor and a first heat regulating chamber...". Accordingly, Applicant submits that claim 1 is no longer indefinite. As such, Applicant requests that Examiner withdraw her rejection under 35 USC 112, second paragraph.

Examiner also states that the term "therewith" (claim 1, line 6) must be "replaced with a direct recitation of the element(s) referenced thereby." Applicant submits that the word "therewith" has a well known and established meaning; *i.e.*, "with it". As evidence of such, Applicant attaches dictionary pages from the Shorter Oxford Dictionary, The Merriam-Webster Dictionary and the New Penguin English Dictionary, which include the word "therewith" and the meaning thereof. The word "therewith" has been highlighted for the Examiner's convenience. Applicant further submits that to require in all cases direct recitation of all elements referenced thereby, would result in unnecessary prolix. Accordingly, Applicant submits that the term "therewith", having a well known and established meaning, is used correctly in claim 1. As such, Applicant requests that the Examiner withdraw her rejection.

With respect to claim 2, Examiner states that the alternative limitations should be written in proper Markush format. Applicant submits that claim 2 as written complies with the requirements of 35 USC 112, second paragraph, and particularly points out and distinctly claims the Applicant's invention. Claim 2 clearly recites that the second heat regulating chamber contains "at least one of a liquid, a gas, a partial vacuum, a solid and a second heat transfer regulating mixture." There is no ambiguity. Accordingly, Applicant requests that the Examiner withdraw her rejection.

With respect to claim 8, Examiner states that the limitations following "capped" are not clear. Applicant has removed the comma after "capped". The claim now reads "... tubular members capped at at least one end thereof ...". Accordingly, applicant submits that amended claim 8 is clear. As such, Applicant requests that Examiner withdraw her rejection.

For all of the reasons set out above, Applicant respectfully submits that the application as amended is in condition for allowance and action toward that goal is respectfully requested.

Should any further clarification be required kindly contact Applicant's agent at 416-862-5790.

Respectfully submitted,



Peter Milne
Registration No. 34,534

Enc.

ABSTRACT

A heat transfer regulating mixture is provided, the mixture having a metallic component A with a melting point T_A and a particulate ceramic component B which is non-wettable by the metallic component A, non-reactive therewith and which has a melting temperature T_B which is higher than both the temperature T_A and a desired operating temperature T_D which is also higher than T_A . The metallic component A and the particulate ceramic component B and their respective amounts will typically be selected to have a higher thermal resistivity below T_A than above T_A . The heat transfer regulating mixture may be incorporated in a thermal flux regulator having the mixture within an enclosure surrounding a heat generating reactor structure.

APPENDIX

TOR_LAW\5760260\I

Shorter Oxford English Dictionary

ON HISTORICAL PRINCIPLES

Fifth edition

VOLUME 2 • N-Z

OXFORD
UNIVERSITY PRESS

there /ðe:/ unstressed **ðə/ adverb, conjunction, pronoun, & noun.**

Also (now dial. & loc.) **ther** /ðə:/.

{Old English *þær*, *þer* = Old Frisian *þær*, Old Saxon *þar* (Dutch *daar*), Old High German *dar* (German *da*), cogn. with Old Norse, Gothic *þar*, from Germanic base also of **THAT, THE**.

► A **adverb.** I **demonstr.** 1 a In or at that place or position. **OE.** ► b Indicating the fact, existence, or occurrence of something, spec. as being pointed out as present to the sight or perception. Freq. in unemphatic use, as (a) preceding *is, was, etc.*; (b) introducing a clause or sentence in which the verb precedes the subject; (c) (now arch. & poet.) following an aux. verb or occurring after the verb and before the subject in an interrog. clause or sentence; (d) (now arch. & colloq.) preceding a rel. clause with omission of the rel. pronoun; (e) arch. constituting an antecedent with omission of the following pronoun. **OE.** ► c Imparting emphasis in addressing a person; esp. (a) (following pers. pronoun, name, rank, etc.) attracting the attention of or summoning the person specified; (b) (following *Hello, hi, etc.*) greeting a person. **colloq.** M16. ► d Imparting emphasis preceding a noun qualified by that, those. **defl. & colloq.** M18.

2 To that place or position. **OE.**

3 ta In that case; then. **OE-LME.** ► b In that matter or business; in that fact or circumstance; in that respect. **OE.**

► c Referring to something said or done; in those words, in that act. L16.

4 At that point or stage in an argument, proceeding, situation, etc.; at that juncture. **ME.**

□ 1 To R. LSHMANN He won't move... he just lies there. G. GREENE Looked up at the... impassive eyes as if he might read them some hint. T. S. ELIOT In the mountains, there you feel free. V. SCANNELL Nottingham: We lived there for three years or so. b BYRON Lurk there no hearts that throb with... pain. TENNYSON I will know if there be any faith in man. W. WOOLF There was Rebecca at the window. D. EDEN So there he was confined to the nursery. c OED Pass along there, please! J. BRAINE 'Hello there.' I said. 'What's new?' d Sir W. SCOTT That trunk is mine, and that there band-box. 2 J. H. NEWMAN When St. Hubert was brought there. OED Going to the meeting?—I am on my way there.

J. B. PRIESTLEY Miss Trant shot a glance there too. 3b J. P. DONLEVY I'd agree with him there. A. TYLER For a while there I imagined I might outdistance him.

c BLACKWOOD'S MAGAZINE There you have hit the nail on the head. OED You have me there! I cannot tell you. 4 SHARES. HAMIL AND THERE put on him What forgeries you please. G. FARQUHAR Brother! hold there, friend; I am no kindred to you.

►† III ref. 5 = WHERE adverb 4. **OE-E16.**

► III As interjection.

6 Expr. annoyance, confirmation, triumph, dismay, satisfaction, encouragement, etc. Also (esp. redupl.) used to soothe a child etc. **M16.**

□ 6 J. S. WINTER But there, what's the good of talking about it. B. PRY There, let it go. B. NEIL This lady has fainted... There, there, my dear.

►† B **conjunction.** 1 = WHERE conjunction 1. **OE-L16.**

2 = WHEREAS conjunction 3. Only in **LME.**

► C **pronoun & noun.** That place or position; a place or position there. **LME.**

□ E. H. SEARS [Motion] requires a here and a there.

V. NABOKOV The scene shifts... to Old Russia, from there to England.

Phrases: all there: see ALL adverb 1. all there is to it: see to preposition, and there's an end: see END noun, been there, done that, (bought the T-shirt) colloq. expr. boredom, impatience, or total lack of interest due to overfamiliarity with something, have been there before colloq. had previous experience of or been fully conversant with that matter or proceeding, here and there: see HERE adverb etc., here, there, and everywhere: see HERE adverb etc. In there US slang (a) (esp. of jazz music) excellent, superlative; (b) well-informed, conversant, neither here nor there: see HERE adverb etc. out there: see out adverb, so there! colloq. expr. defiance or defiant triumph, that there! colloq. that matter, that behaviour: then and there, there and then: see THEN adverb etc. there is no saying: see saying 1. there is nothing in it: see NOTHING pronoun & noun, there it is that is the situation: nothing can be done about it, there or thereabouts in or very near that place or position: fg. something like that, approximately, there's (a) you are a dear, a good girl, etc., by virtue of present or future obedience or cooperation; (b) there's — for you: expr. approval or disapproval of something; Webbs dict. how — someone or something is, there's a thing: see THING noun, there you are colloq. (a) there you go below; (b) that process or action is or will be straightforward; the thing is done, there you go colloq. (a) this is what you wanted etc.; (b) expr. confirmation, triumph, resignation, etc. up there: see UP adverb & adjective.

Comb.: thereabout, thereabouts adverb (a) about or concerning or near that thing etc.; (b) about or near that place, in the neighbourhood. fg. approximately, (freq. in there or thereabouts above): thereabove adverb (a) above or on top of that; more than that; (b) in that place above; in heaven: thereafter adverb (a) now chiefly formal after that (esp. in a book or document); (b) arch. accordingly: thereagainst adverb (arch.) against that: thereamong adverb (long arch. rare) among that, those, or them; thereante adverb (Scot. & north.) about that matter, relating thereto: thereat adverb (arch.) (a) at that place: there; (b) on account of that, after that: thereaway, thereways adverbs (chiefly Scot. & north.) (a) to that place; (b) thereabouts: therebeside adverb (now arch. & poet.) by the side

of that; next to that; nearby: therefrom adverb (arch.) from that: from that place: away from there: therhence adverb (obsolete exc. dial.) (a) from or out of that place; from there; (b) (a) from that source or origin: from that fact or circumstance: thereinto adverb (arch.) into that place; thereon adverb (arch.) (a) on that or it; (b) in that, therein: (c) = thereupon below: thereout adverb (a) (long form or obsolete) outside that place etc.; without; (b) (arch.) from or out of that, from that source: (c) (now Scot.) out of doors: in the open: abroad in existence; (d) (now Scot.) out from that place etc.: thereover adverb (arch.) (a) over or above that; (b) (fig.) in reference to that, concerning that: therewith adverb (obsolete exc. dial.) straightforward, forthwith: therethrough adverb (arch.) (a) through that or it; (b) by means of that, by reason of that: thereby: therefoe adverb (now chiefly formal) (a) to that or it; to that place etc.; (b) to that matter or subject; with regard to that point; (c) in addition to that; besides, moreover: theretofore adverb (long formal) before that time; previously to that: theretoward adverb (rare) toward that: thereunder adverb (formal) under that or it: (esp. in a book or document) under that title, heading, etc.; according to that: thereunto adverb (arch.) to that or it: therewith adverb (arch.) (a) with that (esp. of an addition to a document); in addition to that; besides; (b) on that being done or said; (directly) after that; thereupon: (c) (long form) by means of that, thereby: (d) on account of that; in consequence of that: therewithal adverb (arch.) — therewith (a), (b) above: therewithin adverb (arch.) within or into that place; within there.

□ thereness noun the fact or condition of being there L17. thereby /ðe'baɪ/ adverb. Orig. two words. **OE.**

[from THERE + BY preposition.]

1 By that means, as a result of that; through that. **OE.**

2 Beside, adjacent to, or near that. Now arch. & dial. **ME.**

3 Thereabouts, approximately. **Scot.** M16.

□ 1 New York Times Two great families would come together and thereby found a new line.

therefore /ðe'fɔ:/ adverb & noun. **OE.**

[from THERE + FOR adverb & preposition.]

► A **adverb.** Also (now the only form in sense 1, rare in sense 2) **therrefor** /ðe'fɔ:/.

1 For that; for it; now exp. for that object or purpose. Now chiefly formal. **OE.**

2 For that reason, on account of that; accordingly; consequently. **ME.**

□ 1 W. MORRIS The love I had therfore: Trade Marks Journal Machines for resurfacing ice rinks and parts and fittings therfore. 2 M. ROBERTS Felix has failed, and is therefore destined for the... secondary modern. G. PRIESTLAND Sometimes I think I only exist on paper—that I write, therefore I am.

► B **noun.** The word 'therefore' as marking a conclusion: an expressed conclusion or inference. M17.

therelin /ðe'rɪn/ adverb. Now chiefly formal. **LOE.**

[from THERE + IN preposition.]

► I **demonstr.** 1 In that place; esp. in that book or document; into that place. **LOE.**

2 In that matter, case, etc.; in that particular. **ME.**

3 Inside, indoors. **Scot.** E19.

►† II ref. 8 In which; wherein. **LOE-LME.**

Comb.: thereincfor in a later part of that document etc.; thereincbefore in an earlier part of that document etc.

theremin /θə'remɪn/ noun. **E20.**

[Leon Theremin (1896–1993), Russian engineer, its inventor.]

An electronic musical instrument in which the tone is generated by two high-frequency oscillators and the pitch controlled by the movement of the performer's hand towards and away from the circuit.

theresoif /ðe'rəʊf/ adverb. Now chiefly formal. **OE.**

[from THERE adverb + OF preposition.]

1 Of that, concerning that. **OE.**

2 From that, from there. Now rare. **ME.**

□ 1 D. MELTZER Dreams and analyses thereof to fill out his book. 2 MILTON Much more good thereof shall spring.

theresian noun & adjective var. of TERESIAN.

thereson /ðe'resən/ noun. **ME.**

[from THERE + ON preposition.]

1 Upon that or it. **arch. ME.**

2 On that being done or said: (directly) after that. **LME.**

3 In consequence of that; on that subject or matter; with reference to that. **LME.**

□ 2 J. CONRAD I gave him the tip... Thereupon he lost all interest in me.

theri- combining form see THERIO-.

theriac /θə'rɪæk/ noun & adjective. arch. **LME.**

[Latin *theriaca*: see TREACLE noun.]

► A **noun.** An antidote to poison, esp. to the bite of a poisonous snake. Cf. TREACLE noun 1. **LME.**

► B **adjective.** = THERIACAL. rare. Only in **LME.**

theriacal /θə'rɪækəl/ adjective. Now rare or obsolete. **E17.**

[from prec. + AL!]

Pertaining to or of the nature of a theriac: antidotal.

therian /θə'rɪən/ adjective & noun. **M20.**

[from mod. Latin *Theria* (see below), from Greek *theria* pl. of *therion* wild animal; see AN.]

ZOOLOG. ► A **adjective.** Of or pertaining to the subclass Theria which includes all living mammals except monotremes (prototherians). **M20.**

car. u: arm. v: bed. s: her. i: sit. i: cosy. u: see. o: hot. x: saw. a: run. u: put. u: too. e: ago. ai: my. au: how. ei: day. eo: no. e: hair. i: near. i: boy. ua: poor. u: tire. au: sour

► B **noun.** A mammal of this subclass. **L20.**

therio- /θə'rɪəʊ/ combining form. Before a vowel **theri-**.

[Greek, from *therion* wild animal; see -o-.]

Of, pertaining to, or resembling an animal, esp. (in zoology) a mammal. Cf. **thero-**.

a **therianthropic** adjective of or pertaining to a god represented as combining animal and human forms L19.

theriologic noun the branch of veterinary science which deals with the reproductive systems of animals L20.

theriologic adjective (rare) of or pertaining to the systematic study of animals; zoological; only in M17.

theriomorph /θə'rɪəm(ə)ʊf/ noun & adjective. **E20.**

[from prec. + -MORPH.]

► A **noun.** 1 A representation of an animal form in art. **E20.**

2 = **THEROMORPH.** rare. **E20.**

► B **adjective.** Having the form or characteristics of an animal. **M20.**

theriomorphic /θə'rɪəm(ə)ʊfɪk/ adjective. **L19.**

[formed as prec. + -IC.]

Espr. of a god: having the form of an animal.

a **theriomorphism** noun representation of a person or god in the form of an animal; ascription of animal characteristics to a person. **E20.**

therm /θə:m/ noun¹. Pl. **thermae** /θə:mɪ/. (arch.) **therms**. **M16.**

[Old French *thermes* (pl.) from Latin *thermae* from Greek *thermai* hot baths, from *therme* heat.]

Chiefly CLASSICAL ANTIQUITIES. A public bath. Also (rare), a hot spring. Usu. in pl.

therm /θə:m/ noun². **E10.**

[from Greek *thermos* hot, thermē heat.]

physics t1 = **CALORIE** (b). Only in L19.

2 A quantity of heat equal to 100,000 British thermal units or 1.055×10^6 joules, esp. as (formerly) used in the UK as the statutory unit of gas supplied. **E20.**

therm /θə:m/ noun³ & verb. **E10.**

[Alt. of TERM noun.]

► A **noun.** 1 A pedestal for a bust or statue, esp. of a god. **E16.**

2 A rectangular tapering leg or foot of a chair, table, etc., fashionable in the 18th cent. **L19.**

► B **verb trans.** Make (a leg or foot of a chair, table, etc.) in a rectangular tapering form. **L19.**

therm /θə:m/ noun⁴. colloq. Now rare or obsolete. **E10.**

[Abbreviation.]

= **THERMOMETER**.

therm- combining form see **THERMO-**.

thermae noun pl. see **therm** noun¹.

thermal /θə'm(ə)l/ adjective & noun. **M10.**

[French, from Greek *thermē* heat + -AL'; in sense 1 partly formed as **therm noun¹.**]

► A **adjective.** 1 Of, pertaining to, or of the nature of hot springs; (of a spring etc.) naturally hot or warm; having hot springs. M18.

2 gen. Of or pertaining to heat: determined, measured, caused, or operated by heat. M19. ► b Of underwear etc.: promoting the retention of heat. **L20.**

Special collocation: thermal agitation = thermal motion below. thermal analysis = analysis of a substance by examination of the way its temperature falls on cooling or rises on heating. thermal barrier **absorbs** = heat barrier S.V. **HEAT** noun. thermal bremsstrahlung = electromagnetic radiation produced by the thermal motion of charged particles in a plasma. thermal capacity the capacity of a body to store heat, measured by the quantity of heat required to raise its temperature one degree. thermal conductivity the rate at which heat passes through a substance, expressed as the amount of heat that flows per unit time through unit area with a temperature gradient of one degree per unit distance. thermal cycle a cycle in which the temperature of a substance rises or falls and then returns to its initial value. thermal death point the lowest temperature at which a micro-organism can be killed by heat exposure under specified conditions. thermal diffusion diffusion occurring as a result of the thermal motion of atoms or molecules, esp. as a technique for separating gaseous compounds of different isotopes of an element (which diffuse at different rates in a temperature gradient). thermal diffusivity the thermal conductivity of a substance divided by the product of its density and its specific heat capacity. thermal efficiency the efficiency of an engine measured by the ratio of the work done by it to the heat supplied to it. thermal equilibrium a state in which no net gain, loss, or transfer of heat occurs. thermal imaging the technique of using the heat given off by objects or substances to produce an image of them or to locate them. thermal inertia resistance to change of temperature. thermal lens = **thermic lance**. thermal motion motion of atoms or other particles due to their thermal energy. thermal neutron a neutron which is in thermal equilibrium with its environment (in contrast to a slow neutron). thermal noise harmonic electrical fluctuations arising from the random thermal motion of electrons. thermal paper heat-sensitive paper used in thermal printers. thermal pollution the production of heat, or the discharge of warm water, esp. into a river or lake, on a scale that is potentially harmful ecologically. thermal printer a printer having a matrix of fine pins as the printhead, which are selectively heated to form a character on heat-sensitive paper. thermal radiation

OXFORD
UNIVERSITY PRESS

Great Clarendon Street, Oxford ox2 6DP

Oxford University Press is a department of the University of Oxford.
It furthers the University's objective of excellence in research, scholarship,
and education by publishing worldwide in

Oxford New York

Auckland Bangkok Buenos Aires Cape Town Chennai
Dar es Salaam Delhi Hong Kong Istanbul Karachi Kolkata
Kuala Lumpur Madrid Melbourne Mexico City Mumbai Nairobi
São Paulo Shanghai Singapore Taipei Tokyo Toronto

with an associated company in Berlin

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Published in the United States
by Oxford University Press Inc., New York

© Oxford University Press 1973, 1993, 2002

Database right Oxford University Press (makers)

First edition 1933

Second edition 1936

Third edition 1944

Reprinted with revised etymologies and enlarged addenda 1973

Fourth edition published 1993 as the *New Shorter Oxford English Dictionary*

Fifth edition 2002

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British Library Cataloguing in Publication Data

Data available

Library of Congress Cataloging in Publication Data

Data available

ISBN 0-19-860575-7

ISBN 0-19-860457-2 (thumb index)

10 9 8 7 6 5 4 3 2 1

Typeset in OUP Swift, OUP Argo, and Coranto

by Interactive Sciences Ltd, Gloucester

Printed in the United States of America

Webster's
Third
New International
Dictionary
OF THE ENGLISH LANGUAGE
UNABRIDGED

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MERRIAM-WEBSTER INC., Publishers

SPRINGFIELD, MASSACHUSETTS, U.S.A.



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WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY
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Library of Congress Cataloging in Publication Data
Main entry under title:

Webster's third new international dictionary of
the English language, unabridged.

Includes index.

1. English language—Dictionaries. I. Gove,
Philip Babcock, 1902-1972. II. Merriam-Webster Inc.
PE1625.W36 1986 423 85-31018
ISBN 0-87779-201-1 (blue Sturdite)
ISBN 0-87779-206-2 (imperial buckram)

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MADE IN THE UNITED STATES OF AMERICA

41kp88

THE NEW
PENGUIN
ENGLISH DICTIONARY

Consultant Editor
Robert Allen



PENGUIN BOOKS

PENGUIN BOOKS

Published by the Penguin Group

Penguin Books Ltd, 27 Wrights Lane, London W8 5TZ, England

Penguin Putnam Inc., 375 Hudson Street, New York, New York 10014, USA

Penguin Books Australia Ltd, Ringwood, Victoria, Australia

Penguin Books Canada Ltd, 10 Alcorn Avenue, Toronto, Ontario, Canada M4V 3B2

Penguin Books India (P) Ltd, 11, Community Centre, Panchsheel Park, New Delhi - 110 017, India

Penguin Books (NZ) Ltd, Private Bag 102902, NSMC, Auckland, New Zealand

Penguin Books (South Africa) (Pty) Ltd, 5 Watkins Street, Denver Ext 4, Johannesburg 2094, South Africa

Penguin Books Ltd, Registered Offices: Harmondsworth, Middlesex, England

First published 2000

1

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Typeset in ITC Stone

Printed in Finland by WS Bookwell

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hooter. 4 used as an interjection to express satisfaction, approval, encouragement, or defiance: *There, it's finished; There, it didn't hurt much, did it?* * be there for somebody to give somebody support, advice, and love or friendship. have been there before informal to know about or have experienced something already. so there used to express defiance and emphasize a refusal: *I won't go, so there!* there and back for a round trip. there and then at once. there it is such is the unfortunate fact. there's a ... used when urging a course of action: *Don't sulk, there's a dear!* there, there used when trying to comfort somebody. there you are 1 used when handing or presenting something to somebody. 2 I told you so. [Old English *ther*]

Usage note

there, their, or they're? See note at **THEIR**.

there² pronoun used to introduce a sentence or clause that expresses the idea of existence: *What is there to eat?; There won't be another opportunity.*

there³ noun that place or point.

there⁴ adj non-standard used for emphasis between a demonstrative and the following noun: *that there cow.*

thereabouts (NAmE also thereabout) adv 1 in that vicinity. 2 near that time, number, degree, or quantity: *a boy of 18 or thereabouts.*

thereafter adv after that.

thereat adv formal 1 at that place. 2 because of or after that.

thereby adv 1 by that means; as a result of which. 2 in which connection: *And thereby hangs a tale* — Shakespeare.

there'd /dhead/ contraction there had; there would.

therefor adv formal for that, or in return for that.

therefore /'duhuəfə/ adv 1 because of that; consequently: *The baby was tired and therefore irritable.* 2 as this proves: *I think, therefore I exist.*

therefrom /dheə'froʊm/ adv formal from that or it.

therewith /dheə'wɪθn/ adv formal in that; esp in that respect: *Therein lies the problem.*

therelnafter /dheər'næftə/ adv formal in the following part of that matter, e.g. writing, document, or speech.

therelnto /dheər'ntoʊ/ adv archaic into that or it.

there'll /dheər'l/ contraction there will; there shall.

thereof adv formal 1 of that or it. 2 from that or it.

thereon adv formal on or onto that or it: *a text with a commentary thereon.*

there's /dheəz/ contraction 1 there is. 2 there has.

thereto adv formal 1 to that place. 2 to that matter or document: conditions attaching thereto. 3 archaic in addition.

theretofore /dheətə'faw, dheətəuh'faw/ adv formal up to that time.

thereunder adv formal under that or it: *the heading and the items listed thereunder.*

thereupon adv formal 1 on that matter. 2 immediately after that.

therewith /dheər'wɪθn/ formal with that or it: *a letter enclosed therewith.* 2 archaic thereupon, forthwith.

therewithal /dheəwidhawəl/ adv 1 formal therewith. 2 archaic besides.

therianthropic /θiəriən'θropik/ adj said of mythical creatures: combining human and animal form. [Greek *therion* beast + *anthropos* man]

theriomorphic /θiərioh'mawfik/ adj said esp of a god: having an animal form. [Greek *theriomorphos*, from *therion* beast + *morphe* form]

therm- /θuhm/ **noun** a quantity of heat equal to 100,000Btu (about 105,506J). [Greek *thermē* heat]

therm- or thermo- comb. form forming words, denoting: heat: *thermion; thermostat.* [Greek, from *thermē* heat]

-therm comb. form forming nouns, denoting: an animal having a particular body temperature: *ectotherm.* [Greek *thermē* heat]

thermae /'thuhmee/ noun public baths, esp in ancient Greece or Rome. [via Latin from Greek *thermai*, pl of *thermē* heat]

thermal¹ /'thuhməl/ adj 1 relating to or caused by heat: *thermal stress; thermal insulation.* 2 designed to prevent the dissipation of

body heat: *thermal underwear.* »» **thermally adv.** [Greek *thermē* heat]

thermal² noun 1 a rising body of warm air. 2 (in pl) thermal underwear or clothing.

thermal barrier noun a limit to increase in aircraft or rocket speeds imposed by aerodynamic heating.

thermal capacity noun = **HEAT CAPACITY.**

thermal efficiency noun the ratio of the amount of work done by a heat engine to the amount of energy supplied to it.

thermal imaging noun a technique for detecting and producing a picture of an esp hidden heat source, used e.g. to find missing people or locate a target. »» **thermal imager noun.**

thermalize or thermalise verb trans to cause (neutrons) to lose energy in a reactor and become thermal neutrons as a prelude to nuclear fission.

thermal neutron noun a neutron in thermal equilibrium with its surroundings.

thermal printer noun a printer that uses a heated printing device to produce an image on heat-sensitive paper.

thermal reactor noun a nuclear reactor in which fission is mainly caused by thermal neutrons.

thermal spring noun = **HOT SPRING.**

thermic /'thuhmɪk/ adj = **THERMAL¹:** *thermic energy.* »» **thermically adv.**

thermion /'thuhmiən, -on/ noun an electrically charged particle, specif an electron, emitted by an incandescent substance. [THERM+ION]

thermionic /'thuhmi'ɒnɪk/ adj 1 relating to the emission of thermions. 2 denoting or relating to a device, e.g. a valve, that uses thermionic electrons as charge carriers.

thermionic tube noun = **THERMIONIC VALVE.**

thermionic valve noun an electron tube in which a regulated flow of electrons is produced by thermionic emission from a heated CATHODE (a conducting structure with a negative electric charge), used esp for controlling the flow of current in an electric circuit.

thermistor /thuh'mɪstər/ noun a semiconducting electrical resistor whose resistance varies significantly with temperature. [contraction of *thermal resistor*]

thermit /'thuhmɪt, 'thuhmət/ noun trademark = **THERMITE.**

thermite /'thuhmiet/ noun a mixture of aluminium powder and iron oxide that produces a great deal of heat when ignited and is used in welding and in incendiary bombs.

thermo- comb. form see **THERM-**

thermochimistry /thuhmoh'kemistrɪ/ noun the branch of chemistry dealing with heat changes in chemical reactions. »» **thermochimical adj, thermochimist noun.**

thermochromic /thuhmoh'krohmɪk/ adj able to change colour, reversibly, when heated or cooled, or involving a colour-changing process of this kind.

thermocline /thuhmohklien/ noun a layer of water in a lake, sea, etc that separates an upper warmer zone from a lower colder zone; specif a stratum in which temperature declines at least 1 °C with each metre increase in depth.

thermocouple /thuhmohkupl/ noun a combination of two conductors for producing a thermoelectric effect used in measuring temperature differences.

thermodynamics /,thuhmohdye'namiks, -di'namiks/ pl noun (treated as sing. or pl) the mechanical action of, or relations between, heat and other forms of energy, or the branch of physics that deals with this.

Editorial note

Thermodynamics is used to assess the efficiency of thermal processes and to discuss the equilibrium composition of chemical reactions. There are three laws of thermodynamics. The first law expresses the conservation of energy and the equivalence of heat and work. The second law introduces the concept of increasing entropy as the signpost of spontaneous change. The third law expresses the unattainability of absolute zero — Professor Peter Atkins.

»» **thermodynamic adj, thermodynamically adv, thermodynamicist /'-namɪst/ noun.**

thermoelectric /,thuhmohi'lektrɪk/ adj 1 relating to or dependent on the relationship between temperature and the electrical properties of materials. 2 producing electricity by means of differ-